



Chapter 2

Existing Conditions Summary

This chapter is a summary of the existing conditions report, necessary for comprehension of the remaining chapters. The entire report can be found in Appendix B of this report.

2.1 Existing Passenger Services on the Line

The only existing passenger rail service on the Springfield Line is a regional service operated by Amtrak. Schedules for alternatives in Chapter 3 and the Recommended Action in Chapter 4 include current Amtrak service. Most Amtrak service on the line is shuttle trains, running between Springfield and New Haven, where they connect with other Amtrak Northeast Corridor trains. One round-trip train each day operates through the corridor to Boston to the north and Washington to the south. One round trip train each day operates to and from St. Albans, Vermont from New Haven. The trains also permit connections at New Haven with Amtrak's Northeast Corridor (Washington to Boston) service, as well as Metro North service to New York, and Shore Line East local commuter service to New London. Departures are spread throughout the day, with trains typically operating at intervals of two to three hours. Springfield line services are designed as extensions of Amtrak's Northeast Corridor service, and are not scheduled to serve local commuter trips (home to work trips).

The Amtrak fare structure was substantially reduced in price since this study began. The original fare structure from November 2002 was shown in the existing conditions report, which can be found in Appendix B. Table 2-1 provides a complete listing of the Amtrak fares within the corridor as of April 2003, which is similar to the fare structure in early 2005 as this report is being finalized. 10-ride tickets and monthly passes are also available for the Amtrak service. Although the one-way fare structure for Amtrak is approximately twice the one-way fare structure proposed for start-up commuter rail service, the proposed monthly pass fares for the start-up commuter rail service are approximately the same as the monthly pass fares for current Amtrak service.



**Table 2-1
Amtrak One-Way Fare Table for Intra-Corridor Travel**

Station	New Haven	Wallingford	Meriden	Berlin	Hartford	Windsor	Windsor Locks	Springfield
New Haven	NA							
Wallingford	\$5.00	NA						
Meriden	\$6.00	\$5.00	NA					
Berlin	\$8.00	\$5.00	\$5.00	NA				
Hartford	\$12.00	\$8.00	\$7.00	\$5.00	NA			
Windsor	\$14.00	\$11.00	\$8.00	\$7.00	\$5.00	NA		
Windsor Locks	\$14.00	\$12.00	\$10.00	\$8.00	\$5.00	\$5.00	NA	
Springfield	\$19.00	\$17.00	\$14.00	\$12.00	\$9.00	\$7.00	\$6.00	NA

Source: www.Amtrak.com for travel on April 16, 2003.

Ridership on the Amtrak service within the corridor is collected in terms of boardings and alightings at each station. New Haven was the most frequently used station because of its connections to other Amtrak and commuter services. As shown in Table 2-2, the other seven stations reported 138,141 passenger boardings in Amtrak’s 2002 fiscal year (October 2001 through September 2002). This yields an average of 378 boardings on the line north of New Haven on a “typical” day.

**Table 2-2
Detailed Amtrak Ridership, FY 2002 (October 2001 – September 2002)**

Station	Milepost	Boardings	Alightings	Annual Total	Average Daily Total	Percent of Total
New Haven*	0	205,385	205,728	411,113	1,126	59%
Wallingford	12.6	1,545	2,120	3,665	10	1%
Meriden	18.6	5,304	6,116	11,420	31	2%
Berlin	25.9	7,550	7,766	15,316	42	2%
Hartford	36.6	62,044	62,313	124,357	341	18%
Windsor	43.1	2,929	3,553	6,482	18	1%
Windsor Locks	47.3	4,856	5,536	10,392	28	2%
Springfield	61.9	53,913	54,888	108,801	298	16%
Total		343,526	348,020	691,546	1,895	100%

*New Haven boardings and alightings include data from the Northeast Corridor.

Source: Amtrak’s Fiscal Year 2002 Ridership Data for the Springfield Line

Amtrak ticket sales data were obtained showing the destination station for tickets sold at Springfield, Hartford, Berlin, and Meriden for the first six months of 2002. There are no ticket sales at Windsor, Windsor Locks, or Wallingford stations. These stations are unstaffed and do not have Quick-Trak ticketing machines. The data were useful for gaining a general understanding of current travel patterns between communities on the



Springfield line and the rest of the Amtrak system. The data do not reflect total travel between stations, because tickets may be purchased at locations other than the trip origin or trip destination. Recent data showing total Amtrak passenger volumes at Connecticut stations are shown in Table 2-3. These represent total passengers boarding or alighting at each station.

Table 2-3
Change in Annual Amtrak Station Passenger Volumes at Connecticut Stations,
Fiscal Years 1998 – 2000*

Station	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
New Haven**	255,935	251,130	289,765	370,496	411,113
Wallingford	9,601	8,331	7,885	6,002	3,665
Meriden	27,331	25,066	20,039	16,353	11,420
Berlin	28,569	28,246	25,109	20,326	15,316
Hartford	151,849	151,249	147,043	142,276	124,357
Windsor	8,174	7,994	7,980	7,670	6,482
Windsor Locks	13,747	13,390	13,686	10,704	10,392

*Fiscal Years run from October of the previous calendar year to September of the current one.

**Volumes for New Haven station includes all Amtrak Northeast Corridor Riders.

Source: Amtrak Fiscal Year Ridership Data

The current Amtrak service is too limited to draw conclusions about potential commuter ridership within the corridor. The ticket sales data indicate that some local travel occurs between stations on the Springfield line, but the overwhelming travel pattern served by the weekday trains is travel to New York City. Philadelphia, Washington, and New Haven also attract rail riders, but in decreasing numbers. Table 2-4 below shows the 20 top destinations for tickets purchased at the four stations based on ticket sales January to June, 2002.

Table 2-4
Top 20 Destinations of Springfield Line Riders

From Berlin to:		From Hartford to:		From Meriden to:		From Springfield to:	
New York	1223	New York	9414	New York	452	New York	7623
Philadelphia	279	Philadelphia	2283	Washington	130	Philadelphia	1435
New Haven	230	New Haven	1910	Philadelphia	124	Washington	1211
Washington	193	Washington	1622	New Haven	123	New Haven	1041
Metropark	57	Stamford	594	Newark	41	Chicago	685
Windsor Locks	46	Newark	537	Newport News	38	Newark	515
Trenton	45	Metropark	388	Hartford	33	Trenton	317
Springfield	44	Trenton	375	Orlando	31	Boston	307
Chicago	36	Springfield	368	Trenton	28	Stamford	275
Wilmington	36	Wilmington	282	Wilmington	27	Metropark	274
Hartford	31	Chicago	267	Chicago	26	Wilmington	218



From Berlin to:		From Hartford to:		From Meriden to:		From Springfield to:	
Windsor	29	Baltimore	234	Baltimore	20	Baltimore	187
Orlando	25	Boston South	220	Springfield	19	St. Albans	155
Newark	24	New Rochelle	203	New Carrolton	19	New Rochelle	151
Baltimore	18	Bridgeport	197	Metropark	16	Windsor Locks	147
Baltimore Washington Airport	18	St. Albans	164	Baltimore Washington Airport	15	Amherst	145
Boston	16	Windsor	161	Wallingford	15	Orlando	141
New Carrolton	14	Orlando	152	Stamford	10	Toledo	127
Montreal	13	Windsor Locks	108	Buffalo	10	Albany	126
Richmond	13	New Carrolton	107	Boston	8	Bridgeport	110

* Note-- Excludes tickets purchased at a station with the destination being the same station. For example, 1,141 tickets were sold at Berlin with a destination of Berlin. These represent sales of return tickets from another location to Berlin.

2.2 Existing Freight Services on the Line

There are four freight carriers using the Springfield Line between Springfield (Milepost 62.0) and New Haven Union Station (Milepost 0.0). They include Connecticut Southern (CSO), Boston and Maine Corporation (B&M), CSX Transportation (CSXT), and Providence and Worcester Railroad (PWRR).

Connecticut Southern - The Connecticut Southern Railroad (CSO) is a short-line operator running trains on the line between Springfield and CSX Transportation's Cedar Hill Yard (Milepost 7). Part of the RailAmerica Inc. short-line family of railroads, the carrier is the major freight operator on the line. CSO hauls its own traffic and traffic for CSX Transportation (see below) between Springfield and Cedar Hill. CSO management reported the following train movements.

CSO has four trains on the line Monday through Saturday, with occasional use on Sunday. These trains are:

- **CSO-1**, southbound, departing Springfield at about 6:00 AM, working toward Cedar Hill. The train returns to Springfield in the afternoon.
- **CSO-2**, southbound, departing Hartford at about 7:00 PM working toward Wallingford. The train returns to Hartford at 4:30 AM the next day.
- **CSO-3**, northbound, departing Hartford at about 7:00 AM, working north to Enfield. The train returns to Hartford between 2:00 and 6:00 PM.
- **CSO-4**, northbound, departing about 5:00 PM, working between Hartford and Enfield. The train returns to Hartford in the early morning of the next day.

Traffic on the CSO is growing. When Conrail turned over operations on the line to CSO, Conrail's activity on the line was 20,000 carloads a year, with volumes declining. According to CSO, Conrail was not actively developing traffic on the line. The lowest traffic volume was in 1996, when there were only 16,000 carloads. Presently the annual



total is about 18,000 carloads per year, and rising, with customers returning. By 2007, CSO forecasts that there will be between 22,000 and 23,000 carloads per year, if the construction debris haulage market remains stable.

Growth commodities include trash, hazmat and “dirty dirt”, i.e. the construction debris market. CSO indicated that CSXT has targeted removing trash, or solid municipal waste, as a market that may grow faster than the economy. Markets that will grow with the economy include chemicals (hailed in tank cars), lumber (box cars and flat cars), plastics (hopper cars), paper and pulp (box cars), steel (gondolas), and scrap paper (box cars).

CSO management reported the following concerns over a new commuter rail service on the Springfield line:

- Commuter rail service would restrict the time windows available for freight operations, making it more difficult to run freight trains. Freight transit time would increase.
- Sidings are not in strategic locations to facilitate the passing of freight and passenger trains.
- Sidings are not long enough. The typical train length for the CSO-1 service is 60 to 100 cars, or about 4,000 to 6,000 feet long. According to CSO, sidings need to be 8,000 feet long. (If the route were double-tracked, these concerns would no longer exist.)
- Traffic on the Suffield Branch (the potential rail link to Bradley International Airport from Windsor Locks) is increasing. Customers include wood pulp and special paper shippers and aviation-related shippers. There is also potential for construction debris removal.
- A new commuter rail service would require new maintenance windows (during which time trains cannot operate), which would hinder freight movement on the line.
- The CSO-1 service needs to return to Springfield before 2:00 PM in order to avoid waiting for CSXT and Amtrak operations to clear the CSXT Albany-Boston line before the train can enter CSXT’s West Springfield Yard (the train’s origin and destination).

Boston & Maine Corporation - Boston & Maine is a short-line railroad operating on the Springfield line between Springfield and Berlin (Milepost 26) and a switch to Waterbury. B&M is part of the Guilford Rail System. Guilford management declined to comment on either its train volumes, traffic, or concerns over a new commute rail service. According to Amtrak dispatching records, B&M has two trains operating on the line. These are:

- ***PLED***, northbound, operating twice a week with no set schedule between Berlin and Springfield.
- ***EDPL***, southbound, operating twice a week with no set schedule between Springfield and Berlin.

Reportedly, B&M has operating rights as far south as the Cedar Hill Yard (Milepost 7).



CSX Transportation - CSXT is one of the largest rail systems (a “Class 1” railroad) in the United States. It has operating rights on the entire Springfield Line; however, it relies on CSO to haul its traffic between Springfield and Cedar Hill. According to Amtrak dispatching records, CSXT operates two trains serving shippers on the south end of the line between Cedar Hill and Mill River (Milepost 1.5) Monday through Friday. These are ***B-748*** and ***B-747***, a mid-day train.

CSXT trains can enter Cedar Hill Yard from the south via Mill River. CSXT has operating rights on the New Haven Line (Metro North). CSXT trains exiting the New Haven Line northbound can use the Springfield line between New Haven Union Station and Mill River. At Mill River, CSXT trains can enter the southern end of Cedar Hill Yard.

Providence and Worcester Railroad - The Providence and Worcester Railroad (PWRR) is a short-line railroad operating several lines in Connecticut and Massachusetts. One of these lines enters the CSXT Cedar Hill Yard from the north. PWRR has rights to run on CSXT between Cedar Hill and Mill River, on the Springfield Line between Mill River and New Haven Union Station, and on the New Haven Line between New Haven Union Station and the Devon neighborhood in Milford, where it runs north to Waterbury.

According to PWRR management, five to six days a week there are typically two southbound (or westbound) trains leaving Cedar Hill between 7:00 and 8:00 PM headed to the New Haven Line and ultimately to Waterbury. One returns at 5:00 AM the next day and the other returns at 11:00 AM.

2.3 Existing Stations

The following is a list of existing passenger stations on the line:



New Haven Union Station

Platforms: 6 high platforms

Tracking: 12 tracks

Structure: historic station building



State Street Station

Note: serves Shore Line East, not Amtrak

Platforms: 2 high platforms

Tracking: 5 tracks

Structure: station structure below street level, station opened in June 2002



Wallingford Station

Platforms: 1 low platform

Tracking: 1 track

Structure: historic station structure



Meriden Station

Platforms: 2 low platforms

Tracking: 2 tracks

Structure: enclosed station with seating



Berlin Station

Platforms: 1 low platform

Tracking: 1 track

Structure: historic station structure



Hartford Union Station

Platforms: 1 low platform

Tracking: 1 track

Structure: historic station structure



Windsor Station

Platforms: 1 low platform

Tracking: 1 track

Structure: historic station structure



Windsor Locks Station

Platforms: 1 high platform (newly reconstructed)

Tracking: 1 track

Structure: none



Springfield Union Station

Platforms: 4 low platforms.

Tracking: 4 tracks

Structure: minimal shelter; Union Station to be restored

2.4 Station Parking and Access for Cars

The existing stations within the study area corridor are served by parking facilities in use by Amtrak passengers, other transit passengers and park and ride users. Table 2-5 provides the existing number of parking spaces and usage rates.

Significant parking is available at the three Union Stations. Most of the parking at these stations is filled, however some parking is typically available. As has been noted in other studies, parking is often difficult to find at New Haven Union Station, with parking at the station filled at a very early hour of the morning rush. Currently, a Temple Street Garage Shuttle bus allows parking at other area facilities. The pending construction of a second garage at New Haven Union Station would increase parking, but would temporarily reduce the number of available spaces by 300 due to the loss of the surface lot. Hartford Union Station and Springfield Union Station have nearby privately-owned parking facilities that are within walking distance of the stations.



**Table 2-5
Station Parking Availability and Use**

Station	Parking Spaces	Average 10-Year Use	Highest Use in 10 years	Available spaces at highest use
New Haven Union Station	1153 ¹	N/A ²	N/A ²	0 ³
New Haven State Street	0 ⁴	N/A ⁴	N/A ⁴	N/A ⁴
Wallingford	96	25	65 (1993)	31
Meriden	16	7	16 (1993)	0
Berlin	60	28	43 (1998)	17
Hartford Union Station	197	81	125 (1998)	72
Windsor	86	8	16 (2001)	70
Windsor Locks	100	17	23 (1996)	77
Springfield Union Station	0 ⁵	N/A	N/A	N/A

¹This figure only includes the New Haven Union Station parking structure and adjoining surface parking lot. It does not include a private parking structure (unknown number of spaces) across Union Avenue, nor does it include 600 available spaces at the Temple Street Garage, a quarter-mile away, which is served by a free bus shuttle. An additional parking structure is planned at New Haven Union Station.

²This figure is not available for New Haven Union Station because the 10-year data available did not break down availability at Union Station as listed above in footnote 1.

³Current utilization for year 2003, using assumptions in footnote 1.

⁴There are 300 private parking spaces in downtown surface lots near the State Street station that are not exclusively dedicated for station use. The State Street Station opened for operation in June, 2002.

⁵There is no dedicated parking available at this station at this time, although on-street parking is available, and a total of 3,170 spaces in structures, surface lots, and on-street were inventoried within a few blocks of the station in 1999. After renovation, the station is planned to have 1,100 new spaces available.

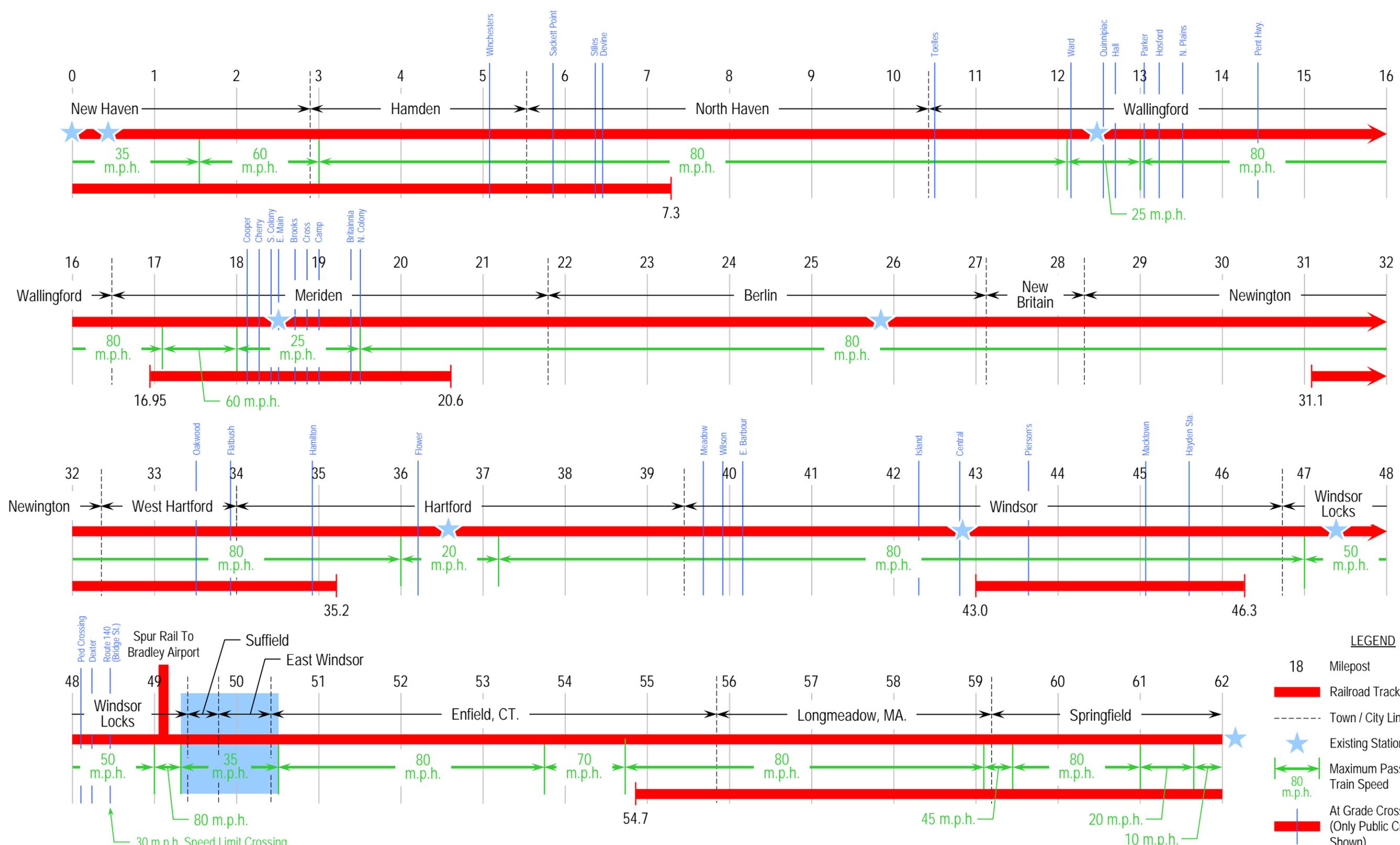
Sources: ConnDOT Parking Survey, Union Station [Springfield] Draft Environmental Impact Report/Environmental Assessment (Feb. 2000), PVTA web site

2.5 Existing Track Evaluation

Two segments of track were reviewed as part of this study, the New England Subdivision Springfield line and the Suffield Industrial track. Figure 2-1 provides a schematic of the track layout for the Springfield Line.

New England Subdivision Springfield Line

This trackage is owned and operated by the National Railroad Passenger Corporation (Amtrak). The segment is described as the Springfield Line of the New England Division. It is primarily a single-track system that starts at New Haven, Connecticut, milepost 0.00 and extends to Springfield, Massachusetts, milepost 62.00. It is operated at a maximum speed of 80 miles per hour (though there are speed restrictions in specific locations as described below). It is therefore maintained as Class IV trackage as defined by the Federal Railroad Administration (FRA) Track Safety Standards. This was at one



SCHEMATIC OF EXISTING TRACK LAYOUTS, SPRINGFIELD LINE
 NEW HAVEN - HARTFORD – SPRINGFIELD COMMUTER RAIL FEASIBILITY STUDY

- LEGEND**
- 18 Milepost
 - Railroad Tracks
 - Town / City Line
 - Existing Station
 - Maximum Passenger Train Speed
 - At Grade Crossing (Only Public Crossings Shown)
 - Connecticut River Bridge



time a double-track railroad but has since been rationalized for centralized traffic control. Train dispatching is handled out of Boston, Massachusetts.

As is illustrated in Figure 2-1 the corridor contains 23.7 miles of double track and 38.2 miles of single track. Double track is available:

- Through New Haven into North Haven (7.2 mi)
- Most of Meriden (3.5 mi)
- A small segment in Newington and West Hartford (2.3 mi, not including Parkville industrial track)
- Windsor to Windsor Locks stations (3.6 mi)
- Enfield Station area into Springfield (7.1 mi)

There are 54 at-grade crossings, of which 36 grade crossings are equipped with active warning devices, and 10 Grade Crossings without active warning devices. At-Grade crossings can have various levels of treatments depending upon such factors as traffic volumes, roadway speeds, and whether the roadway being crossed is a public highway or private property access

The track structure is predominately 119 LB RE continuous welded rail on wood ties fastened by two cut spikes. Double shoulder plates are secured with two spikes. The track is anchored in accordance with standard plans.

An inspection of the line was made on January 6, 2003. As of that date there are two temporary speed restrictions on the line. The first restriction is a 60 mph limit located at milepost 7.1 on track #1. This order has been in effect for several years because of bridge conditions. The second temporary speed restriction is 30 mph located at milepost 43.08 on track #2. This order has also been in effect for several years because of bridge conditions.

There are a number of permanent speed restrictions that are related to signal design, bridge design or track geometry. There appear to be several restrictions placed at the request of local communities. Speed restrictions may also have been instituted because of a high concentration of at-grade crossings in a short distance, or because other geometric or structural limitations (curves or bridge loadings) require that trains maintain a slower speed through specific segments. Areas with speed restrictions are pictured in Figure 2-1 and include:

- New Haven (35 mph)
- Wallingford (25 mph)
- Meriden (25 mph)
- Hartford (20 mph)
- Windsor Locks (50, 30 mph)
- Connecticut River Bridge (35 mph)
- Springfield (20, 10 mph)



Ride quality over main line switches and road crossing is generally fair to poor. Rail condition is very good as is the general condition of track ties. Ballast sections are full and comply with standards. There are no significant vegetation concerns relative to the track structure.

The overall ride quality of this line segment is best described as good. There are, however, concerns regarding line and surface conditions at numerous road crossings and switches. In addition, there are a number of bridge approaches with line and surface defects.

Suffield Industrial Track

The Suffield Industrial Track (spur line), shown in Figure 2-2, was visited on January 6, 2003. This track originates at milepost 49.0 on the Springfield line and continues for about 8 miles through the Suffield Industrial Area, the Turnpike Industrial Park, Bradley and International Airport to Crown Industrial Park. The spur crosses and recrosses Route 75 to reach Crown Industrial Park, the end of the line.

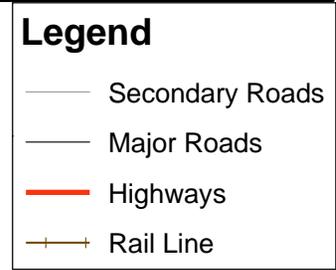
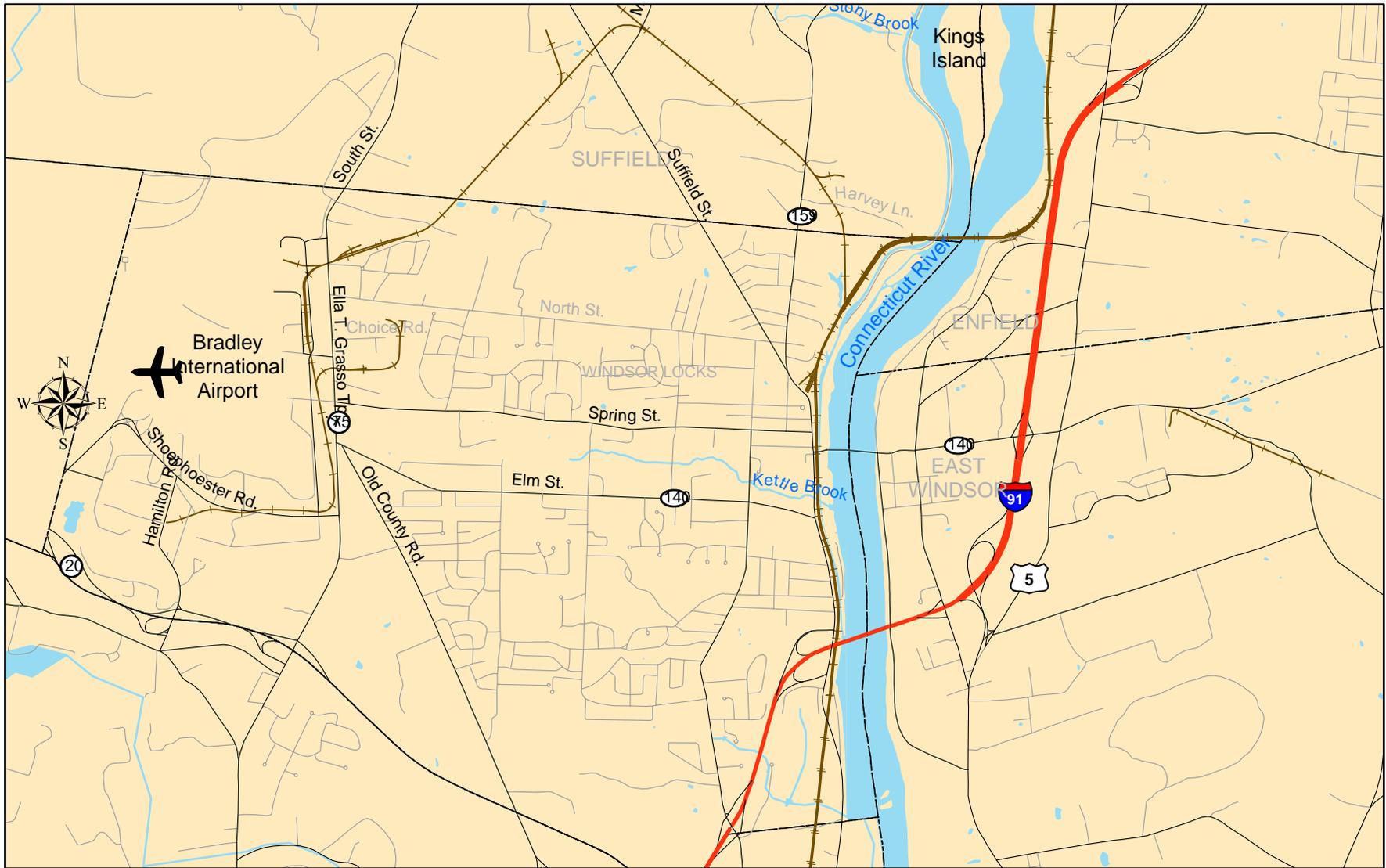
Connecticut Southern (CSO) operates on the line at least three days a week. The CSO Train Number 4, a local (a “local” is a train that picks up and delivers cars at and to shippers located along lines between yards; locals have the lowest priority of trains on a line) works the track. Shippers are located all along the spur. Shippers on the line generate between 400 and 500 carloads a year. CSO anticipates that the line’s traffic will increase.

CSO maintains the track for a maximum 10 mph operation (excepted track). The industrial track is actually part of the Suffield Branch, which extends beyond the spur (switch near Mather Street) to Suffield. However, that track is presently out of service due to a trestle that is in need of repairs. CSO owns the Suffield Branch, and leases about 2 miles of the industrial track near the airport from the State of Connecticut.

The line is non-signaled. Most grade crossings are equipped with passive warning devices (crossbuck signs). The track is constructed with bolted rail on wood ties.

There has been no production program work performed on this line for many years. Accordingly, tie condition is marginal, switches are in poor condition and grade crossing surfaces are low and rough. Vegetation growth is excessive and drainage conditions are poor.

The Suffield Industrial Track would require a major capital investment to achieve FRA Class IV condition, having a maximum allowable operating speed for passenger trains of 80 miles per hour.



Study Area Corridor Bradley Airport Spur

New Haven - Hartford - Springfield
Commuter Rail Feasibility Study



Figure 2-2



2.6 Existing Communications and Signal Systems Evaluation

Amtrak's 62-mile Springfield Line operationally begins in New Haven at Mill River interlocking, railroad Mile Post 1.5, and continues north to Springfield, MA, to milepost 61.7. Mill River interlocking is a key communications and signal control point location that comprises the physical junction of the Springfield Line which operates North / South and the Amtrak-owned Shore Line portion of the Northeast Corridor that operates East / West from New Haven to Boston, MA. At Mill River interlocking, trains leaving New Haven bound for points on the Springfield Line are diverted north and trains bound for points on the Shoreline are diverted east. The operational end of the Springfield Line is at the north limits of "Spring" interlocking, milepost 61.7, where it then connects to the CSX-owned Boston and Albany Main Line at Springfield Station.

Unlike the Northeast Corridor from New Haven to Boston and from New Haven to Washington, D.C., the Springfield Line is not electrified through an overhead catenary system. Originally a two-track "main line," the Springfield Line is now a single-track line with remote controlled passing sidings that allow trains to safely pass each other in different directions, or for one train to pass another traveling in the same direction.

Primary Springfield Line Communications & Signal system elements include:

- Cab Signal System (CSS) and Automatic Block Signal (ABS) train control system with 10 controlled passing sidings; bi-directional or "261" signaling to accommodate train movements in either direction; Springfield Line train dispatchers are located in Amtrak's Centralized Traffic and Electrification Control (CETC) facility in South Station, Boston, MA.
- 36 grade crossings equipped with active warning devices
- 10 grade crossings without active warning devices
- 6 radio repeater sites for train dispatching, maintenance-of-way, and Amtrak Police use; local passenger station services radio use
- 2 local telephone system exchanges (New Haven and Hartford); leased telephone lines for remote supervision of primary signal control points
- Fiber-optic cable is installed in some sections of the Springfield Line but it is owned and maintained by communications service providers (AT&T, MCI, Sprint) and not by Amtrak

Amtrak maintains primary 480-volt AC and 2200-volt AC power distribution systems that provide lower voltage service feeds to all communications & signal facilities, including grade crossings.



2.7 Maintenance Facilities

There are two railroad equipment maintenance facilities in the New Haven area, which were reviewed as potential maintenance facilities for diesel-powered Springfield Line commuter rail rolling stock. Both are owned by the Connecticut Department of Transportation (ConnDOT). One is for the maintenance of Shore Line East equipment and the other is for Metro North equipment.

The Shore Line East facility is approximately 2 years old. The facility has four tracks inside the shop structure. At any given time, 2 diesel-powered train sets (locomotive and cars) can be serviced inside the structure, while 2 others remain outside the shop. In addition to the track, the facility has three overhead cranes, a drop table, a small machine shop, and a welding area. The car wash machine has been decommissioned at this time.

Amtrak currently maintains Shore Line East equipment under contract to ConnDOT. The facility maintains a total of 6 train sets, comprised of 8 locomotives and 22 cab-cars (cars with an operator's compartment at one end) and coaches, including spares. Amtrak reported that it has no available space at this facility for maintaining additional diesel-powered Springfield Line commuter rail equipment. While the Shore Line East shop operates on a six-day, two-shift schedule, maintenance of additional equipment associated with a potential New Haven – Hartford – Springfield Commuter Rail service could not be accommodated at this facility because of limitations in the number of tracks to store and service additional equipment.

ConnDOT recently constructed a storage area to conduct running repairs adjacent to the facility. With these tracks, Shore Line East cars can have their vacuum systems cleaned near the maintenance facility rather than at the New Haven Union Station platform tracks.

At the present time, the yard and maintenance facility currently have limited capacity for expanded commuter operations.

Attached to the Shore Line East facility is another facility for the maintenance of Metro North commuter equipment. The equipment maintained here are electric powered train sets. As this facility is an electric equipment maintenance shop, ConnDOT does not consider that this facility would be appropriate for maintenance of diesel-powered Springfield Line commuter rail equipment.

Plans are being developed to provide additional and improved maintenance facilities in New Haven for both the near and long-term needs of the Shore Line East services. The study team does not anticipate that this will impact the need for a New Haven to Springfield Rail shop.



2.8 Amtrak Bridges Evaluation

The evaluation of existing conditions of Amtrak bridges in the study corridor is based solely on the review of Amtrak bridge inspection reports. No site visits, inspections, or other field activities were performed. Based on advisement by Amtrak officials, available bridge load rating reports for structures located on the Springfield Line were deemed outdated and to have inconsequential information for the evaluation of each bridge. Therefore, load rating reports were not used in this Existing Condition Assessment.

The study team reviewed the Amtrak 2002 bridge and culvert inspection reports for the Springfield Line, from milepost 0.76 to milepost 62.08. Following review, the team selected the 33 railroad bridges having the largest total length and summarized the bridge inspection report information. The furnished bridge and culvert inspection reports included:

- 14 culverts with span lengths from 5 ft to 6 ft
- 5 overhead signal bridges
- 10 overhead utility bridges
- 4 overhead pedestrian/foot bridges
- 2 undergrade pedestrian bridges
- 69 overhead bridges (highway or foreign railroad)
- 60 undergrade bridges (railroad) with total lengths from 7 ft to 1516 ft
- 174 culverts with span lengths from 1 ft to 5 ft

During review of all available data, multiple bridge types were omitted. These bridge types include overhead signal bridges, overhead utility bridges, pedestrian/foot bridges, all overhead structures in which Amtrak crosses under the structure, bridges not currently in use, and culverts (span length less than 6 ft). The 33 railroad bridges with the largest total length were then selected for inclusion in the report. These 33 railroad bridges vary from single spans up to 25 spans and have total lengths ranging from 28 feet to 1,541 feet. The 33 railroad bridges consisted of the following types:

- Concrete Arch
- Concrete Encased Through Girder
- Deck Girder
- Concrete Box Beam
- Stone Arch
- I-Beam
- Through Girder
- Concrete Encased I-Beam
- Concrete Box
- Through Truss



Bridge inspection reports contain the results of annual field reviews of each bridge by Amtrak staff. The reports contain subjective ratings of substructure and superstructure components based on a rating scale of 1 to 6, with 1 being excellent, 5 being serious and 6 being failed. The 33 bridges were grouped by their overall structural condition. These conditions were based on a comprehensive look at all pertinent (substructure and superstructure) structural items on the Amtrak bridge inspection reports. There were no bridges in excellent condition. Approximately 43% (14 of 33 bridges) of the railroad bridges studied had computed ratings of good condition. Approximately 39% (13 of 33 bridges) of the railroad bridges studied had computed ratings of fair condition. Approximately 15 percent (5 of 33 bridges) of the railroad bridges had computed ratings of poor condition. These bridges are listed in Table 2-6:

Table 2-6
Bridges on Springfield Line Rated as “Poor”

Bridge Number (Milepost)	Location	Bridge Type
1.61	Humphrey Street, New Haven	Encased Through Girder
26.39	Willow Brook, Berlin	Stone Arch
35.51	Capitol Avenue, Hartford*	Through Girder
61.71	East Columbus Avenue, Springfield	Through Girder
61.98	Dwight Street, Springfield	Through Girder

*To be replaced as part of the New Britain – Hartford Busway project.

Approximately six percent (2 of 33 bridges) of the railroad bridges had computed ratings of serious condition. These bridges are listed in Table 2-7:

Table 2-7
Bridges on Springfield Line Rated as “Serious”

Bridge Number (Milepost)	Location	Bridge Type
1.48	Mill River, New Haven	Concrete Arch
36.66	Church Street, Hartford	Deck Girder

There were no bridges in a failed condition.

The structural condition of bridges rated “Fair”, “Poor” or “Serious” can be attributed mainly to:

- The type of structure built – certain types of structures are more susceptible to deterioration due to exposure of critical structural members to weather.
- The age of the structure – there are many structures which have outlived their useful design life.



- The level of maintenance performed on the structure to date.
- The presence of highway salt spray.

Presently, six of the 33 bridges studied are now in the category of “Poor” or “Serious”. Of the remaining bridges, 13 are currently rated “Fair”. In general, all bridges will continue to deteriorate. Rates of deterioration will depend on current condition and future maintenance activities. It should be noted that this evaluation was limited to the 33 longest bridges on the Springfield Line.

2.9 Connecting Rail Service

In addition to the existing Amtrak service between stations in the corridor, connections to other Amtrak rail service areas is available in New Haven and Springfield. From Springfield Union Station, service is available westward to Albany, eastward to Boston, and northward to Vermont.

From New Haven Union Station, intercity rail service is available southbound to New York City (and ultimately Washington DC), and northbound to Rhode Island and Boston.

Connections with Metro North’s New Haven Line and the Shore Line East commuter rail are also available from New Haven’s Union Station and State Street Station.

Amtrak

Effective October 28, 2002, southbound Northeast Corridor service on Amtrak stopping at New Haven includes eight Acela Express and nine other trains during Monday through Thursday (ten on Fridays). On weekends, there are six southbound Acela Express trains and eight other trains on Saturdays (nine on Sunday). Northbound Acela Express service includes seven trains on weekdays with nine other trains Monday through Thursday (ten on Friday). Weekend southbound service includes five Acela Express along with 10 other trains.

Springfield and Hartford are both served by five southbound Amtrak trains on weekdays, five southbound trains on Saturdays, and six southbound trains on Sundays. Northbound, both cities are served by six trains on weekdays, five trains on Saturdays, and six trains on Sundays. Most of these trains also serve intermediate Amtrak stations in Wallingford, Meriden, Berlin, Windsor and Windsor Locks, although several bypass those towns.

Springfield is also served by east-west Amtrak trains between Albany and Boston (Lake Shore Limited service). Two eastbound trains to Boston are offered daily, (at 4:00 PM, 6:55 PM weekdays and 7:55 weekends) and one westbound train is offered daily to Albany (at 12:10 PM).



Metro North

For Metro North Service, from Union Station, there are 34 weekday trains heading towards Stamford or New York and 38 weekday trains arriving from New York or Stamford. From the State Street Station, weekday service towards New York is limited to two morning trains ending at Stamford (shared with Shore Line East), and four trains arriving at New York's Grand Central Station. Weekday service from points west is limited to two morning trains arriving at State Street, (one from Bridgeport and one from Grand Central) and two evening trains (one from Bridgeport and one from Stamford). The Bridgeport and Stamford trains are shared with Shore Line East Service.

On Saturdays, New Haven Metro North service includes 23 trains, only from Union Station, heading into New York, and 24 trains returning from Union Station. On Sundays, 21 trains serve Union Station into New York, and 22 trains return from New York.

Shore Line East

Shore Line East service connects New Haven and New London, with several additional trains per day serving Bridgeport and Stamford directly in express service from New Haven (and allowing shared service with Metro North passengers on those trains). There is no Shore Line East service on weekends. The following schedule was effective October 28, 2002.

Weekday westbound Shore Line East Service includes seven morning trains between Old Saybrook and New Haven. (Two of those trains also serve New London). Those trains arrive in New Haven between 6:15 AM and 10:00 AM. Service does not resume until the afternoon. Westbound evening trains include five express trains from Old Saybrook directly to New Haven (three of which also serve New London). The non-express trains all serve State Street Station in addition to Union Station. One additional special train is run on Friday afternoons in the summer to Old Saybrook.

For eastbound Shore Line East Service, three trains express in the morning from Union Station in New Haven (between 5:05 AM and 8:19 AM) directly to Old Saybrook (one continuing on to New London). Eight trains are provided in the afternoon and evening to Old Saybrook, three of which continue on to New London. One special train to Old Saybrook is provided on Friday afternoons in the summer. After the last eastbound train has left New Haven at 7:48 PM, Shore Line East passengers can also use a CTTransit bus that stops at Shore Line East stations through Old Saybrook, leaving New Haven at 8:42 PM.



2.10 Other Transportation Corridor Services

The following section highlights the existing transportation network that serves the Springfield Line study area. The infrastructure that is discussed includes roadways, livery service, intercity bus, local bus transit, para-transit services, and ride-sharing services.

2.10.1 Parallel Roadway Traffic Volumes, Speed and Levels of Service

I-91 is the primary parallel roadway competing with potential commuter rail service along the Springfield Line. Route 5, which also serves the corridor, primarily provides local access to commercial land uses, residential land uses and town centers. Table 2-8 shows average daily traffic at selected locations along I-91.

Table 2-8
I-91 2004 Average Daily Traffic at Continuous Count Stations

Location	Northbound	Southbound
Wallingford	41,600	43,300
Wethersfield	62,500	75,900
Enfield	52,700	52,000

Source: ConnDOT Traffic Count Locator

2.10.2 Livery Services

Bradley International Airport in Windsor Locks, Connecticut provides Central Connecticut and Central/Western Massachusetts with airline service. Nine operating surface transportation (seven limousine) services operate at the airport. These limousine services are listed in Table 2-9.

Table 2-9
Livery Services at Bradley International Airport

Service (listed Alphabetically)	Service Area	Service Type
Advantage Limousine, Inc.	Passenger Destination	Private limousine
Bradways Limo Service	Western Massachusetts	Private limousine
Connecticut Limo	West to Danbury, South to Bridgeport	Van share
Joshua's Limousine Service	Connecticut, New England	Private limousine
Lindsey Limousine	Passenger Destination	Private limousine
Thomas Transportation	Mass, New Hampshire, Vermont	Van share
Valley Transporter	Passenger Destination	Van share

Source: <http://www.bradleyairport.com/easy/transportation.shtml>.



2.10.3 Intercity Bus Operations

Intercity bus service is provided within the study corridor, generally using I-91. The major bus stations in the corridor are in New Haven, Hartford, and Springfield; however, stations in Meriden, Enfield and Windsor Locks also are served by some intercity bus service. East-West intercity bus routes also serve all of the major cities in the corridor. Routes on the I-95 corridor serve New Haven; routes on the I-84 corridor serve Hartford; and routes on the I-90 corridor serve Springfield.

Greyhound and Peter Pan - Greyhound and Peter Pan coordinate operations, mostly along I-91 within the New Haven - Springfield corridor. Intercity bus passengers may buy tickets from either company and use them for almost all trips between Springfield and New Haven. Peter Pan is the principal service provider to points east of Springfield. The corridor has six intercity bus terminals: New Haven, Meriden, Hartford, Bradley International Airport (Windsor Locks), Enfield, and Springfield. Peter Pan serves Windsor Locks and Enfield exclusively and Greyhound and Peter Pan both serve the other four stations. The combined services offer approximately 20 bus trips daily in each direction on the corridor. As of October 2002, sample fares included \$19.00 from Springfield to New Haven or Meriden and \$8.00 from Springfield to Hartford. Bus service for Bradley International Airport is limited to trips from Bradley Airport to Hartford and between Bradley Airport and Springfield. Neither Peter Pan nor Greyhound offer bus service to Bradley from Hartford. Private livery services, such as Connecticut Limousine, offer transit services to and from Bradley.

Bonanza - Bonanza provides bus service to Hartford and Springfield, but does not offer service in the North-South corridor. These two stations are used as intermediate stops on services to Providence, Albany and New York City that use regional highways such as Interstates 84 and 90 and Route 6. For the most part, services to and from Hartford and Springfield charge passengers about \$20 one way. Twenty Bonanza buses serve Hartford and four buses serve Springfield everyday.

Arrow - Arrow Line, Inc, a Coach USA company, provides some intercity bus service within the New Haven-Springfield Corridor. Hartford is served by several of Arrow's various services. Routes that serve Hartford include bus service between Farmington and Foxwoods and commuter service between Willimantic and Hartford and Meriden and Hartford. Connecticut DOT subsidizes the commuter services. CTTransit accepts Arrow monthly bus passes for service within Downtown Hartford.

DATTCO - DATTCO, headquartered in New Britain, provides a variety of bus services in Connecticut. Among the different types of services offered by DATTCO, two bus routes make stops in communities within the study corridor. One service, called the S-Route, operates buses between Madison and New Haven on weekdays. DATTCO's "Commuter Express" provides bus service between Hartford and Old Saybrook, with stops in Old Saybrook, Essex, Chester, Middletown and Hartford. This route is served with three morning and three evening peak direction trips on weekdays.



2.10.4 Transit Service and Ridership

CTTransit provides local and express bus service in the greater Hartford and New Haven areas. Fifteen routes serve New Haven, with service to the two railroad stations in New Haven and a parking shuttle between New Haven Union Station and the Temple Street garage nearby. The S route serving Madison from downtown New Haven is operated by DATTCO. Hartford is a major hub that is served by a myriad of local and express routes. Several of these routes provide service to the rail corridor.

CTTransit serves Wallingford on one intercity route out of New Haven and one local route provided by Northeast Transportation Company (NET). Northeast Transportation (NET) under contract to CTTransit and ConnDOT operates three routes in Meriden, Routes A, B, and C. Meriden’s Amtrak train station is the focal point of the city’s bus network. CTTransit Hartford also provides bus service to Meriden with an express route to Hartford, and the New Britain Transportation Company (NBTC) serves Meriden with one route. Berlin is also served by NBTC on one local route to downtown New Britain.

Springfield, Massachusetts is the principal hub for PVRTA service. Every bus route in Springfield stops at the intermodal center in Downtown Springfield. The intermodal center allows people to connect to Amtrak service and intercity bus service. Eighteen PVRTA routes serve the Springfield area, linking Springfield with Enfield, Connecticut, Longmeadow, East Longmeadow, West Springfield, Agawam, Chicopee, Holyoke and Ludlow, Massachusetts.

Table 2-10 to Table 2-13 list the corridor local and express bus routes and daily or monthly ridership.

Table 2-10
CTTransit New Haven Bus Routes with 2001 Weekday* Ridership

Route	Route Name	Headways	Weekday Boardings
B	Whalley Avenue	5 to 15 minutes	4,364
	Congress Avenue	5 to 20 minutes	3,083
C	North Haven	15 to 60 minutes	1,093
D	Grand Avenue	10 to 20 minutes	3,491
	Dixwell Avenue	10 to 30 minutes	4,644
F	West Chapel Street	10 to 30 minutes	2,007
	East Haven	15 to 30 minutes	980
G	Shelton Ave/ East Chapel Street	20 to 30 minutes	780
J	Whitney Avenue	10 to 60 minutes	1,370
	Kimberly Avenue	5 to 35 minutes	2,065
L	North Branford	65 minutes	98
M	Washington Ave/ State Street	9 to 75 minutes	2,225
O	Winchester Avenue	15 to 62 minutes	1,045



Route	Route Name	Headways	Weekday Boardings
	Sylvan Avenue ¹	10 to 60 minutes	1,991
Q	State Street/ Edgewood Ave.	15 to 60 minutes	1,914
S ²	Route 1 Madison	30 to 95 minutes	N/A
Z	Goffe Street/ Sargent Drive	5 to 30 minutes	2,027
CC	Commuter Connection Downtown New Haven	25 to 80 minutes	306
	Commuter Connection Sargent Drive	23 to 85 minutes	39
	Temple Street Parking Shuttle	5 to 39 minutes	N/A

*2001 ridership reflects a single day's boardings **Source:** CTTransit and Connecticut DOT data.

Table 2-11
Wallingford, Meriden and New Britain Transit Routes with 2001 Weekday* Ridership

Route	Route Name	Headways	Weekday Boardings
Wallingford	Wallingford Local	60 minutes	51
Meriden A	Yale Acres – Westfield Shopping Town	60 minutes	133
Meriden B	Kohl's – South Meriden	60 minutes	158
Meriden C	West Main St. – East Main St.	60 minutes	203
NBTC A	Arch Street – Meriden Square Mall	60 minutes	155
NBTC BK	Berlin Kensington	60 minutes	195

*2001 ridership reflects a single day's boardings **Source:** CTTransit and Connecticut DOT data.

Table 2-12
CTTransit Hartford Bus Routes with 2001 Weekday* Ridership

Route	Route Name	Headways	Weekday Boardings
A	Hillside Avenue	7 to 30 minutes	1,181
E	Farmington Avenue	10 to 75 minutes	6,439
F	Ashley Street	12 to 85 minutes	2,073
K	North Main Street	20 minutes	3,746
K	Park Street	5 to 10 minutes	4,510
L	Tower Ave Crosstown	60 minutes	289
N	Windsor	25 to 60 minutes	1,196
Q	New Britain Avenue	9 to 34 minutes	3,364
S	Granby St./Garden St.	7 to 28 minutes	1,730
T	Blue Hills Avenue	10 to 80 minutes	4,663
T	Franklin Avenue	60 minutes	3,377
P	New Britain	30 minutes	805
W	Capitol Avenue	15 to 60 minutes	627

¹ Includes two one way trips of Post Mall Flyer (PMF)

² Route operated by DATTCO.



Route	Route Name	Headways	Weekday Boardings
W	Weston St.	15 to 30 minutes	417
2	Corbins	20 to 25 minutes	208
5/13	Enfield/ Windsor Locks Express	10 to 50 minutes peak	866
7	Newington Commuter Express	20 to 50 minutes	98
9	Unionville	30 to 31 minutes	76
15	Windsor Express	30 minutes	N/A
BTF	Berlin Turnpike Flyer	10 to 85 minutes	N/A
BDL	Bradley Flyer	60 minutes	410
WND/ BMF	Windsor/ Bloomfield Industrial	22 to 50 minutes	104

*2001 ridership reflects a single day's boardings **Source:** CTTransit and Connecticut DOT data.

Table 2-13
Pioneer Valley Transit Springfield Bus Routes Monthly Ridership June 2002

Route	Route Name	Weekday Headways	Monthly Riders
1	Fairfield Mall/ Sumner – Allen	10 to 85 minutes	68,425
2	Carew-East Springfield/ Belmont-Dwight Rd.	10 to 105 minutes	77,360
3	Springfield Plaza via Liberty/ King- Westford	20 to 90 minutes	40,525
4	Plainfield/ Walnut Street- Springfield College	20 to 40 minutes	20,030
5	Dickinson-Jewish Home/ Springfield Bus Terminal	20 to 90 minutes	10,010
6	Ludlow via Bay	20 to 90 minutes	34,315
7	State-Boston Road/ Eastfield Mall	15 to 60 minutes	89,845
8	Orange-Plumtree/ Springfield Bus Terminal	60 minutes	9,225
9/15	St. James Avenue/ Worthington Street	10 to 60 minutes	7,140
10	Westfield State College/ West Springfield	20 to 60 minutes	27,920
11	Holyoke Community College Express	60 to 105 minutes	0*
12	Stonybrook Express	120 minutes	2,150
13	Maple Street/ East Longmeadow	30 to 60 minutes	14,830
14	Feeding Hills/ Springfield	30 to 60 minutes	8,770
16	Longmeadow/ Enfield	70 to 180 minutes	1,835
17	Eastfield Mall via Parker-Wilbraham Road	30 to 60 minutes	23,100
20	Holyoke/ Springfield via Holyoke Mall	15 to 85 minutes	64,420
21	Holyoke/ Springfield via Chicopee	30 minutes	35,435

*With school out of session in June, the bus' demand pool is significantly decreased. Over the first five months of the year the service attracted 24,175 riders.

Source: Sandra Sheehan of the PVTA. Ridership data collected by First Transit in June 2002

2.10.5 ADA Paratransit Services

Several agencies offer ADA (Americans with Disabilities Act) paratransit services for the mobility impaired and aged in the study corridor. The Greater New Haven Transit District provides ADA and dial-a-ride service for people within CTTransit's New Haven service area. Northeast Transportation provides ADA service within Wallingford and Meriden. The Greater Hartford Transit District provides paratransit service in



CTTransit's Hartford service area. The PVTA provides paratransit service within greater Springfield. ADA trips can be made to any points within three-quarters of a mile of regular bus service for all four services during normal bus operating hours.

2.10.6 Ridesharing

Two rideshare agencies operate in the New Haven - Springfield corridor, including Rideworks in New Haven and the Rideshare Company in Hartford. Massachusetts ridesharing programs are more focused on Boston than on the Springfield area, however some of the Hartford ridesharing options include connections to Springfield.

2.11 Ridership, Revenue and Cost Database

The following section is an inventory of how other commuter rail systems perform, and will serve as a baseline for evaluation of service in the study corridor. Data was collected from 15 transit agencies that operate commuter rail service and was assembled, where available, for the years 1999, 2000, and 2001. Data was collected by way of the National Transit Database (NTD), a program sponsored by the Federal Transit Administration (FTA), and by contacting the specific transit agency where necessary. The NTD is a large compilation of data reported by agencies nationwide that operate various modes of transit including commuter rail. More specific information on types of data obtained for purposes of this study is discussed below. The specific information collected from each agency includes the following:

- Total annual passengers – the total number of fare paying passengers boarding a service vehicle in a fiscal year
- Average daily ridership – the average daily number of fare paying passengers boarding commuter rail service vehicles in a fiscal year
- Passenger miles per year – the total distance each fare paying passenger travels on passenger carrying vehicles per fiscal year
- Total annual fare revenue – the total amount of revenue received by a transit agency for a given service each year from fare paying passengers
- Annual revenue train miles – the total number of miles per year each entire commuter train travels with fare paying passengers aboard
- Annual revenue vehicle miles – the total number of miles per year each passenger carrying vehicle in a commuter rail system travels with fare paying passengers aboard
- Annual operating costs – the total amount of money per year required to operate and maintain a transit service



2.11.1 Overview of Commuter Rail Systems

To compare ridership, service characteristics, and performance for a New Haven-Hartford-Springfield commuter service, information was collected from other agencies that operate commuter rail service. Data was collected from a range of agencies operating a range of commuter rail services from a large network such as Metro North or Long Island Railroad, to smaller systems such as Shore Line East in Connecticut. A summary of the transit agencies surveyed, listed in alphabetical order, is shown in Table 2-14.

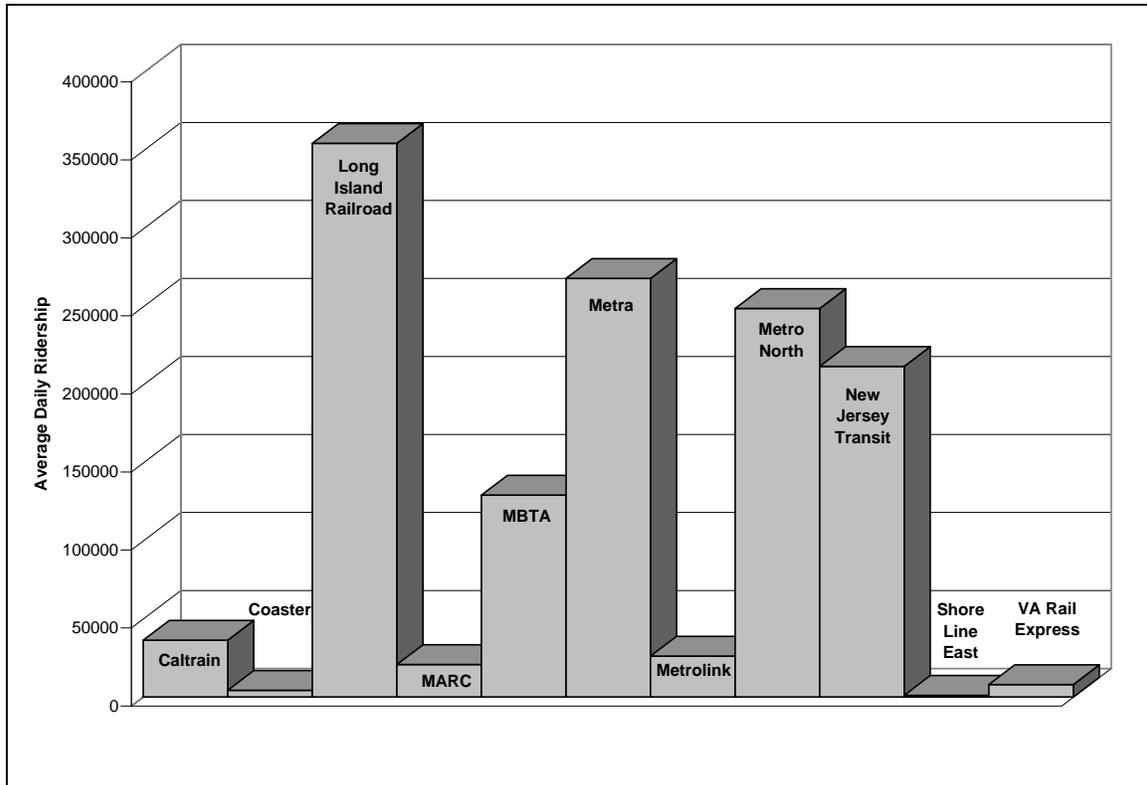
Table 2-14
Summary of Commuter Rail Systems Surveyed

Commuter Rail System	Operating Agency	Metro Area Served	Total Annual Passengers (2000)	Average Daily Ridership (2000)
Caltrain	Caltrain	San Francisco/San Jose, CA	9,821,725	39,290
Long Island Railroad	Metropolitan Transportation Authority	New York/Long Island, NY	105,148,000	355,000
MARC Commuter Rail	Mass Transit Administration, MD Dept. of Transportation	Baltimore, MD /Washington, DC	5,317,006	20,851
MBTA Commuter Rail	Massachusetts Bay Transportation Authority	Boston, MA	36,416,816	129,474
Metra Commuter Rail	Northeast Illinois Commuter Railroad Corporation	Chicago, IL	72,342,624	268,381
Metrolink	Southern California Regional Rail Authority	Los Angeles, CA	6,978,588	26,300
Metro North	Metropolitan Transportation Authority	New York, NY	71,735,218	249,142
New Jersey Transit	New Jersey Transit Corporation	New Jersey	63,894,352	212,037
San Diego Coaster	North San Diego County Transit Development Board	San Diego, CA	1,206,839	4,327
SEPTA	Southeastern Pennsylvania Transportation Authority	Philadelphia, PA	29,774,426	104,232
Shore Line East	Connecticut Dept. of Transportation	New Haven, CT	285,427	1,115
Sounder Commuter Rail	Central Puget Sound Regional Transit Authority	Seattle, WA	100,360	1,120
Trinity Rail Express	Dallas Area Rapid Transit Authority	Dallas/Ft. Worth, TX	667,577	2,369
Tri-Rail	Tri-County Commuter Rail Authority	South Florida	2,232,497	7,381
Virginia Rail Express	Virginia Rail Express	Washington, DC/Northern VA	2,014,339	8,057

Source: National Transit Database

The commuter rail systems inventoried represent a wide range of services from a single rail line, to a network of several lines serving a major metropolitan area. A key statistic that highlights the size of a commuter rail network is ridership. Table 2-14 shows the average daily ridership among commuter rail systems, and this data is shown graphically for selected systems in Figure 2-3.

Figure 2-3
Average Year 2000 Daily Ridership for Selected Commuter Rail Systems

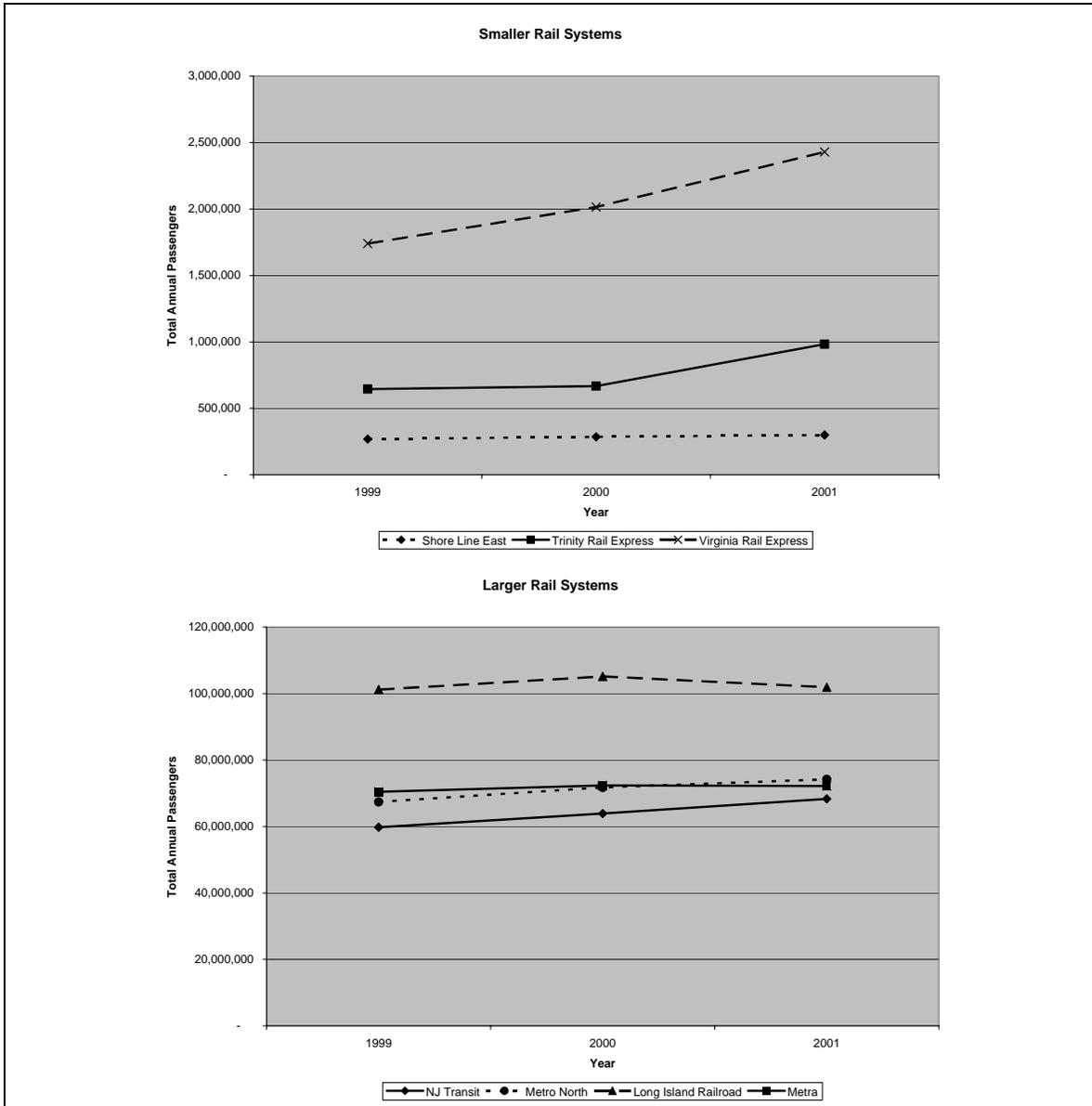


Source: National Transit Database

As shown in the above figure, the range of daily ridership in systems surveyed varies greatly, from just over 1,000, to over 350,000 passengers per day. The smallest system surveyed was Shore Line East in Connecticut, with a year 2000 average daily ridership of 1,115. The largest system surveyed was Long Island Railroad in New York, with a year 2000 average daily ridership of 355,000.

In addition to daily passenger data, annual ridership numbers were obtained. Figure 2-4 shows annual ridership trends for several commuter rail systems from 1999 to 2001. The reason that results are displayed separately for smaller and larger commuter rail systems is for clarity of scale in the chart, and to illustrate smaller trends.

**Figure 2-4
Annual Ridership per Year**



Source: National Transit Database

As shown above, all of the commuter rail systems had an overall increase in ridership from 1999 to 2001. Between 2000 and 2001, Metra and Long Island Railroad showed a slight decrease. Some systems such as Virginia Rail Express and Trinity Rail Express have shown a fairly substantial rise in ridership from 1999 to 2001. Other systems such as Shore Line East and New Jersey Transit have experienced a more modest increase over the same period.



2.11.2 Performance Measures

The ridership, revenue, and cost data assembled from the various transit agencies can be evaluated in a manner such that the relationship between cost and revenue shows certain performance measures. These measures include; revenue per passenger mile, operating cost per passenger mile, operating cost per train mile, farebox recovery ratio, and productivity ratio. Revenue per passenger mile is determined by the ratio of total fare revenue per year to total passenger miles per year. An average figure for this performance measure is approximately 12 cents per mile. Operating costs per train mile and per passenger mile are determined by similar ratios. Average costs are approximately \$45 per mile and 30 cents per mile respectively. The farebox recovery ratio is given by the ratio of total fare revenue to total operating costs. It is a measurement of how much of a passenger fare goes toward the costs associated with operating a transit system. This ratio is usually found to be between 20% and 40%. Finally, an overall productivity ratio measures annual passenger miles against annual vehicle miles. The result of this productivity ratio yields an average of the number of passengers per vehicle. A summary of performance measures for the commuter rail systems surveyed is found in Table 2-15.

As shown in the table, the amount of revenue a commuter rail service can expect per mile from each fare paying passenger can vary from \$0.08 on the Tri-Rail system for the 1999 fiscal year to as much as \$0.91 for Trinity Rail Express for the same year. On some of the larger systems such as Metro North and Long Island Railroad, revenue per passenger mile was anywhere from \$0.15 to \$0.17. For the Shore Line East service revenue per passenger mile was \$0.13 in the fiscal year 1999, and rose to \$0.16 in 2001.

The cost of operating commuter rail service per train mile was also found to have a wide range. SEPTA was found to have the lowest cost per train mile at \$30.52 in the fiscal year 2001. For the same year, Long Island Railroad cost \$103.95 per train mile to operate service. The cost per train mile in 2001 on Shore Line East was \$37.94.

Cost per passenger mile is an effective way of looking at the relationship between ridership and the cost to operate a commuter rail service. This value was found to be as low as \$0.23 in 2001 on the MBTA system, to as high as \$1.14 on Shore Line East for the same year. Those same values for Metro North and Long Island Railroad were \$0.26 and \$0.36 per passenger mile respectively.

The farebox recovery ratio was found to have a fairly large variation from one rail system to another. The value was as low as 13% for Shore Line East to as high as 61% for Metro North in 2000. The overall trend shows that the larger commuter rail networks had a higher farebox recovery ratio, meaning that their fares went further toward operating costs.

The productivity ratio also showed a significant variance among commuter rail systems. Shore Line East, for example, had a productivity ratio of just over 16 passengers per



vehicle in 2000. In the same year, Caltrain had a productivity ratio of over 42 passengers per vehicle.

Table 2-15
Year 2000 Annual Operating Costs for Selected Commuter Rail Systems

Rail System	Year	Revenue per Passenger Mile	Operating Cost per Train Mile	Operating Cost per Passenger Mile	Farebox Recovery Ratio	Productivity
Caltrain	1999	\$0.13	\$42.82	\$0.25	51%	24.89
	2000	\$0.13	\$44.95	\$0.23	58%	48.27
	2001	\$0.14	\$48.62	\$0.26	54%	45.41
Long Island Railroad	1999	\$0.16	\$92.70	\$0.32	51%	37.66
	2000	\$0.15	\$95.00	\$0.29	51%	41.95
	2001	\$0.17	\$103.95	\$0.36	47%	37.05
MARC	1999	\$0.11	\$48.51	\$0.29	39%	33.32
	2000	\$0.12	\$48.63	\$0.27	44%	35.29
	2001	\$0.12	\$54.67	\$0.28	42%	39.48
MBTA	1999	\$0.10	\$46.65	\$0.24	41%	32.62
	2000	\$0.10	\$47.86	\$0.25	40%	32.75
	2001	\$0.11	\$47.53	\$0.23	49%	35.72
Metra	1999	\$0.12	\$59.57	\$0.25	49%	43.79
	2000	\$0.12	\$62.67	\$0.25	48%	43.95
	2001	\$0.12	\$64.98	\$0.26	46%	42.70
Metrolink	1999	\$0.12	\$45.84	\$0.30	39%	37.75
	2000	\$0.12	\$47.19	\$0.32	39%	39.54
	2001	\$0.13	\$40.41	\$0.27	48%	40.53
Metro North	1999	\$0.17	\$79.75	\$0.30	57%	39.23
	2000	\$0.16	\$76.37	\$0.27	61%	41.57
	2001	\$0.16	\$79.28	\$0.26	59%	44.22
New Jersey Transit	1999	\$0.18	\$51.32	\$0.31	57%	27.75
	2000	\$0.18	\$52.48	\$0.31	57%	29.62
	2001	\$0.18	\$53.42	\$0.31	56%	29.94
San Diego Coaster	1999	\$0.08	\$72.37	\$0.44	19%	32.34
	2000	\$0.09	\$54.18	\$0.33	28%	31.97
	2001	\$0.11	\$56.90	\$0.35	30%	31.62
SEPTA	1999	\$0.18	\$29.29	\$0.36	40%	28.56
	2000	\$0.19	\$30.25	\$0.38	41%	28.43
	2001	\$0.21	\$30.52	\$0.42	41%	25.77
Shore Line East	1999	\$0.13	\$35.60	\$0.99	14%	12.59
	2000	\$0.14	\$46.03	\$1.03	13%	16.17
	2001	\$0.16	\$37.94	\$1.14	14%	11.85
Trinity Rail Express	1999	\$0.91	\$49.76	\$1.20	76%	20.71
	2000	\$0.83	\$59.57	\$1.41	59%	20.37
	2001	\$0.47	\$42.80	\$1.00	47%	21.19
Tri-Rail	1999	\$0.08	\$31.30	\$0.29	27%	35.94
	2000	\$0.08	\$33.92	\$0.31	25%	36.88
	2001	\$0.08	\$36.14	\$0.29	27%	38.26
Virginia Rail Express	1999	\$0.16	\$66.94	\$0.34	46%	40.50
	2000	\$0.13	\$57.93	\$0.28	47%	43.76
	2001	\$0.14	\$59.28	\$0.29	49%	43.43